



FIG. 1

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1 GGTCTCTGGAGCGCCCTGGGTTGCCCGGCCGGTCCCTGCCGCTGACTTGTTGACACTGCG
61 AGCACTCAGTCCCTCCCGCGCGCCTCCTCCCCGCCCCGCCGCTCCTCCTCCCTGTA
121 ACATGCCATAGTGCGCCTGCGACCACACGGCCGGGGCGCTAGCGTTGCGCTTCAGCCACC
181 ATGGGGAATGGGATGAACAAGATCCTGCCCGGCCTGTACATCGGCAACTTCAAAGATGCC
M G N G M N K I L P G L Y I G N F K D A 20
241 AGAGACGCGGAACAATTGAGCAAGAACAAGGTGACACATATTCTGTCTGTCCATGATAGT
R D A E Q L S K N K V T H I L S V H D S 40
301 GCCAGGCCTATGTTGGAGGGAGTTAAATACCTGTGCATCCCAGCAGCGGATTCAACATCT
A R P M L E G V K Y L C I P A A D S P S 60
361 CAAAACCTGACAAGACATTTCAAAGAAAGTATTAAATTCAATCAGAGTGCCGGCTCCGC
Q N L T R H F K E S I K F I H E C R L R 80
421 GGTGAGAGCTGCCTTGTACACTGCCTGGCCGGGGTCTCCAGGAGCGTGACACTGGTGATC
G E S C L V H C L A G V S R S V T L V I 100
481 GCATACATCATGACCGTCACTGACTTTGGCTGGGAGGATGCCCTGCACACCGTGCGTGCT
A Y I M T V T D F G W E D A L H T V R A 120
541 GGGAGATCCTGTGCCAACCCCAACGTGGGCTTCCAGAGACAGCTCCAGGAGTTTGAGAAG
G R S C A N P N V G F Q R Q L Q E F E K 140
601 CATGAGGTCCATCAGTATCGGCAGTGGCTGAAGGAAGAATATGGAGAGAGCCCTTTGCAG
H E V H Q Y R Q W L K E E Y G E S P L Q 160
661 GATGCAGAAGAAGCCAAAAACATTCTGGGTAAATATAAGGAGCAAGGGCGCACAGAGCCC
D A E E A K N I L G K Y K E Q G R T E P 180
721 CAGCCCGGCGCCAGGCGGTGGAGCAGTTTTCCGGCACTGGCTCCGCTGACCTACGATAAT
Q P G A R R W S S F P A L A P L T Y D N 200
781 TATACGACGGAGACCTAACGCAAGCGACCTGCTGCCTTCCTTCCCACTGCTTGTCTTCAG
Y T T E T * 205
841 TGTGCCCGGCTGGGCAGGGTGCGGTGGTGGTGGCCGATGAGACAGGAAAGGGAGATAGCC
901 AGGGCGAGGTGGGGCGAGGGCTCTTTCCCCCAAGCAACACCGCCCAGCCTTGTTCCAGGC
961 CCTTGCACTCCGCCCACCCTACCTGGCTGCACCTGAGCTTGCTGCCCCCGGGATGTTGC
1021 CCAGTGGCTGTGCACTGCTCTGTGCACGTGCGTGTGTGTGAGTGCACTTGTGTGTGGGTG
1081 ACTAAGTGGATGCATGTGTGTGCCTGTGTGAGTGAGGGTATGTGCACCTAAGTGTGTACA
1141 TGTGTGTATGTTGTGAAAGTGTCTGTGCACATGAATGTTGTGTGAGTGTGAACCTCTTTC
1201 TTACTGCTGGAAGTCACA 1218

FIG.2

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1  AGCCCCGGCGCGCCATGGGGAGTGGGATGAGCCAGATCCTGCCGGGCTGTACATTGGCA
    M G S G M S Q I L P G L Y I G N 16
61  ACTTCAAAGACGCAAGAGATGCAGAACAGTTGAGCAGGAACAAGGTGACACACATTCTTT
    F K D A R D A E Q L S R N K V T H I L S 36
121 CTGTGCACGATACTGCCAGGCCCATGTTGGAGGGAGTTAAATACCTGTGTATTCCAGCGG
    V H D T A R P M L E G V K Y L C I P A A 56
181 CAGACACACCATCTCAAACCTGACAAGACATTTCAAAGAAAGCATTAAATTCATTATG
    D T P S Q N L T R H F K E S I K F I H E 76
241 AGTGCCGACTCCAGGGTGAGAGCTGTCTGTACATTGCCTGGCTGGGGTCTCCAGGAGTG
    C R L Q G E S C L V H C L A G V S R S V 96
301 TGACATTGGTGATCGCATACATCACGACTGTCACCGACTTTGGCTGGGAAGATGCCTTGC
    T L V I A Y I T T V T D F G W E D A L H 116
361 ACACTGTTCTGCGGGAGGTCCTGTGCCAACCCCAACCTGGGCTTTCAAAGGCAGCCGC
    T V R A G R S C A N P N L G F Q R Q P Q 136
421 AGGAGTTTGAGAAACATGAAGTGACCAAGTATCGGCAATGGCTGAGAGAAGAGTATGGAG
    E F E K H E V H Q Y R Q W L R E E Y G E 156
481 AGAACCCCTTTGCGGGATGCAGAAGAAGCCAAAATATTCTGGGTAAATATAAAGAGCAAG
    N P L R D A E E A K N I L G K Y K E Q G 176
541 GGCPCATGGAGCCCCGGCCTAGCAGCAGGCGGTGGAGCAGCTTCTCAACCTGCCTCCTC
    R M E P R P S S R R W S S F S T L P P L 196
601 TCACCTACAATAACTACACAACAGAGACCTAACAGAGAGAGCTGGTGTCTGCCTTCCTGC
    T Y N N Y T T E T * 205
661 TGCGGGTCTTCTGGGTTGCCTACCATGTGCTGGTGTGCCTGGTGTGCTGGCTCCTGCCTC
721 TGAGGACTACGAGAGGAGGTGCGCAGCAAGGTGGAGCACTCAGGGCTCCTTCTCAGAATAC
781 CGCCCTACTCAGGCTTTTTCACTCTCCCATCTTCGCCCCATCTTTTCTCACCTGAACCT
841 GCCCCAACCTGGGATGCTGCCCGGCCACCGTGTACTTCTCGTATGTGTGCAGGCGTGTGGA
901 TGTGCATGTATGTGTCTAAGAGTGTGCATATATACCTACAAATGTATGCATTGTGAACAA
961 GTACACATGTAAATGTGTCTCTGCATGTGGGCACTGAGTGTATGGTGTGCTGAAAGTTAT
1021 AAACACCCGCTGCCAGAAGTCAATGGTCAATCCCACATGGAAGTCATTTG
1081 AACTTGCCCTCCTGGAAGCTACTCCACCAAGTACAGCTTATGCCTGTGCTGAGTGAGAG
1141 CTCAGGGTGTGGCAGCTGGAACAGTGGTGTTCAGATTCTGAGATGAGCAGGGAAG
1201 GGACAGGACCCTCCTGAGGAAGAGTGGCATAATCCTAGTGAGTTTTATGTCTGTGGGAAC
1261 AAGGGAGGGGCTTTCTGAGCACTGTCTTGACTTGATAAGTATACTTGCCAGCCCGTCAT
1321 GGCCCTGAGTTCCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCT
1381 GATATGGTATGGTGACAGGGTGGACCTGAGACTCAGTAGGCCTATACCAGAGGCTCTGGCC
1441 CACTCCTGTCTGCTTTTAAACACTTTAGCTCTGGCTTAGCTCTTGTGTCAGGGGTCTCAT
1501 CTCAGGTTTGCATGTACCTGCAGGAAGTGGTGTTCAGATTCTGAGATGAGCAGTATTAAC
1561 ATTTGTGATTTAAATGCCTACGCATTCACTGAGCTCACTGTTGTATGCTGTGGATTGGA
1621 CCGCTACCTCATGAAGTTCTTCTTCTTCTTCTTCTTCTTCTTCTTCTTCTTCTTCTTCT
1681 TCCTTCTTCTTCTTCTTCTTCTTCTTCTTCTTCTTCTTCTTCTTCTTCTTCTTCTTCTT
1741 CATAGTTGAGAATGTTTGTATGTGACTATTGTTTTTGAACCAAAGAGAAGAGCATACT
1801 TATGTCATTGAGTGATTTAAATTTGAGCTTGGCTTGGCTTCTGTAGGGTTTCTAGTGACTA
1861 AACCTACATTCTGACCATGAGAGTCTTATGTTCAAAGTATGTGGCAGCAGGCACCCCTAG
1921 AAGTTTTGCACAGTCCAGTGTCCAGTCTTTATGCCAATTACGTTGCTTAAGCATGCAG
1981 GACCATGCAAATGAAAATACACTCAACCTCTCCCTAAACGTAAGTGTGACAGGCATCTC
2041 TGAAGCTTAAGAAACCCCAAGAAGCCCCGAGGAGCTGGACAGTGGTGGCACACACCTT
2101 TAATCCCAGCTTTTGGGAGGCAGAGGCAGGCGGATTTCTGAGTTCAAGGCCAGCCTGGTC
2161 TACAGAGTGAGTTCAGGACAGCCAGGCTACACAGAGAAACCTGTCCCGAAAACCAA
2221 AAAAAAAAAAAAAAAAAAAGGAGAAGCCCTGAGGAAGAAGCAGCAGGCTCTCTCTGTGT
2281 GTGTGGAGCTCTCAGGGACCCAGGGAAGGTGTGGTTGCCAGCTCTCTGTGTGCAGGCCGT
2341 GCCAAGCAATAGCATGAGTGACGCTGAGTACCTGAGTATGTGTGCACGTGTATGAACAG
2401 CTGCATACCTTTCCATAGGTTCTCAACTGTCTCAATTTTTGTTGCCAGTAATGTTCTTTC
2461 TCCACAGCTGCTCCGGGAATTCTGAAGTACTGGGCCTTTCTCAGAAGACTGTAATGTACC
2521 TGAAGTTTCTGAAATATTGCAAAGTTCAAGGTGGTGCTGCCAAAAGAAAAGTGATGTAA
2581 AGTTTATTTTTAAGAATCCAATAGTGATTTGTATACTTGTTTTTTTTCATTTTAAACCA
2641 AATGCATGTATAATCATGTGGGAATATGTTAAGATCTATGGATATTCTGTAGCAAGAGAA
2701 ATATCTTTGCCTTAACTCCACTGCTGTGGTTGTTCTTGGACCTGACCGATGCTCATACA
2761 ATAATCTCAAGAGCCCTGTCTGTTTCGTAATAGTAACTACTTCTCATGAACACTACCCAA
2821 GGAGGAAGCCTGCACCTGGGAAGTGTGCAGTGTGAGCTCTGCCCTCCTGTAAAGTCTCC
2881 AGCTCTAGACATGTCTCTGGGTGTGTTTTATCTACTGGTGTATTCTATATGGTAGAA
2941 TTACCAAAGCTATTCAAGTTTCTTAATAAAGGGCAAATCCCGGAATCTTTGNTTTTTA
3001 CCCTGGAAGA 3010

```

FIG. 3(a)

mJKAP MSQILPGLYIGNFKDARDAEQLSRNKVTHILSVHDTARPMLE--G-VKYLCPAAADTPSQNLTRHF

pucker ed

rMKP3

rMKPX

hMKP4

rMKP2

mMKP1

mM3/6

mPAC1

hVH3

hVHR

ASP WFFPHLLGLGNGRDADNPSSVGA---NCVLNVITCQSPNESHLOGLKYMQUIPASDTPHQNIUKQYFF
PVEILPFLYLGLCAKADSTNLDVLEEFGLKYGKIKYIILNVITPMLPNLFFENAGFEFKYKQIPIISDHWSONLSQFFF
PVQIILPYLYLGLCAKADSTNLDVLEEFGLKYGKIKYIILNVITPMLPNLFAFEHNGCEFTYKQIPIISDHWSONLSQFFF
PVQIILPNLYLGSARDSANLESIAKLGIRYIILNVITPMLPNLFFEKGDFFHYKQIPIISDHWSONLSRFFF
PVEILPFLYLGSAYHAAARRDMLDALGIGITALLNVSSDCPNHFE--GHYQYKCIPIVEDNHNKADISSWFF
PVEILSFLYLGSAYHASRKDMLDALGIGITALLNVSSDCPNHFE--GHYQYKSIPIVEDNHNKADISSWFF
LTR ILPHLYLGSQKDLVNLKDLMTQNGISYVLCNASNSCPKPDFIC-ESREMRIPINDNYCEKLLPWL
PVEILPFLYLGSACNHSSDLQGLQACGITTALLNVSSASCPNHFE--GLFHYKSIPIVEDNQMVEISSWFF
PVEILPFLYLGSAYHASKCEFLANLHUTALLNVSSRRRTSEAC-M-TLHYKWIPIVEDSHTADISSHF
VGNASVAQDIPKQLKLGITHVNLNAAEGRSFVHVNTHANFYK-DSG-ITYLGLIKANDITQEFNLSAYFF

...c.o.s.e.n.s.u.s.....r.v...i.l.p.f.l.v.l.g.s.a.k.d.....d.v.l.....g.i.t...i.l.n.v.t...n...p.o...f.....g...f.k.y.k...I.p.i...D.....n.l.s...f.f

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{KESTIKFIH-ECRLQGESC[LVHCL]AGVSRSVITLVJAYITTVTDFGWEDALHTVRAGRSCANPNLGFQRQPEFEKHE

QEAYDFIE-DARKTGSRRVLLHCHAGISRSATIAIAYVMRYKSLSLLEAYKLVKVARPIISPNLNFMSGQLLEEQNL
PEAISFID-EARRGKNCGLVHCLAGISRSVITVTWVAYLMQKLNLSLNDAYDIIVKMKKSNISPNFNFMGQLLDFERTL
PEAISFID-EARRSKKCGVLVHCLAGISRSVITVTWVAYLMQKLNLSLNDAYDIIVKMKKSNISPNFNFMGQLLDFERTL
PEAIEFID-EALSQNCGLVHCLAGISRSVITVTWVAYLMQKLNLSLNDAYDIIVKMKKSNISPNFNFMGQLLDFERTL
MEAIEVID-AVKDCRGRVVEVHCCAGISRSATICLCLAYLMRTNRVKLDEAFEFVKKRRSISPNFSSFMGQLLQFESQV
NEAIDFID-SIKDAGGRVVEVHCCAGISRSATICLCLAYLMRTNRVKLDEAFEFVKKRRSISPNFSSFMGQLLQFESQV
DKSIEFID-KAKLSSCCQVIVVHCCAGISRSATIAIAYIMKTGMSSDDAYRFFVKDARRPSISPNFNFLGQLLEYERSL
QEASIFID-SVKNSSGGRRVLVHCCAGISRSATICLCLAYLIQSHRVRLEAFDFVKKRRSISPNFSSFMGQLLQFESQV
QEADIFID-CVREKGGKVLVHCEAGTSRSPITICMAYLMKTKQFRLEAFDFYIKQRRSMVSPNFGFMGQLLQVESEI
ERAAAFIDQALAQKNGRRVLVHCREGYSRSPITLVIAYLMMRQKMDVKSALSIVRQNR-EIGPNDGFLAQQLCQLNDRL

...e.a.i.e.f.i.d.....f.....r.v.j.v.H.C...a.g.i.S.R.S...I.i...v.A.Y.I.m.....J...I...d.A.y.d.f.y.k...k.r.s...i.s.P.N.f...F.m.g.Q.I.l.d.f.e.....J

FIG.3(b)

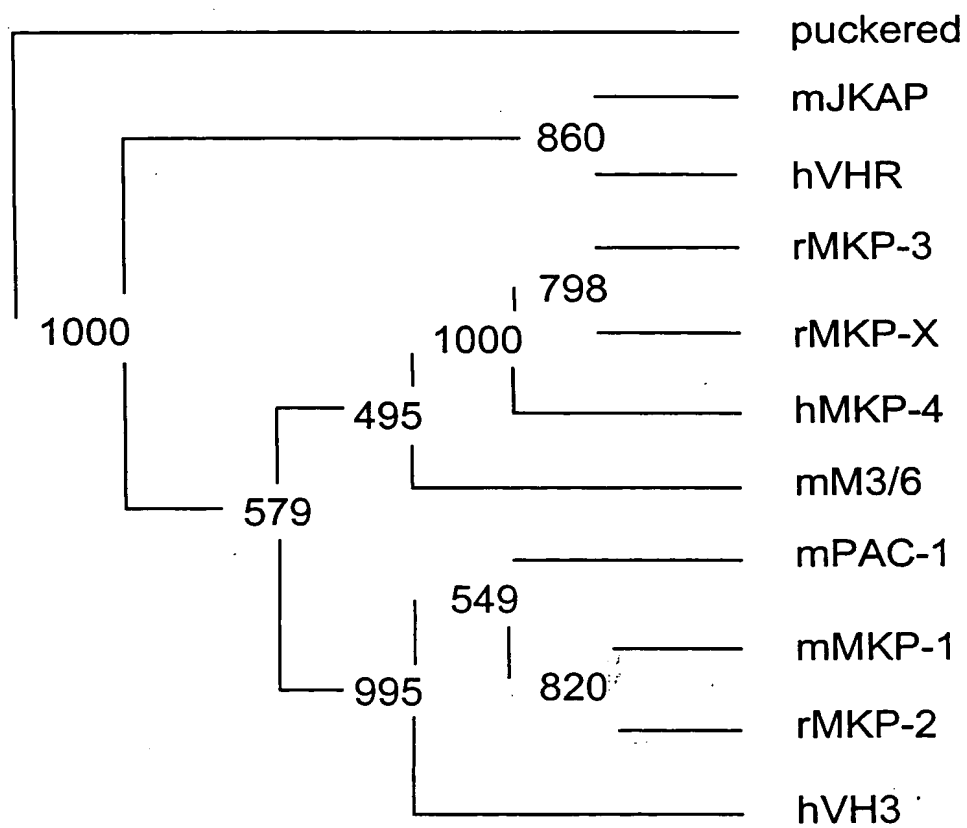


FIG.3(c)

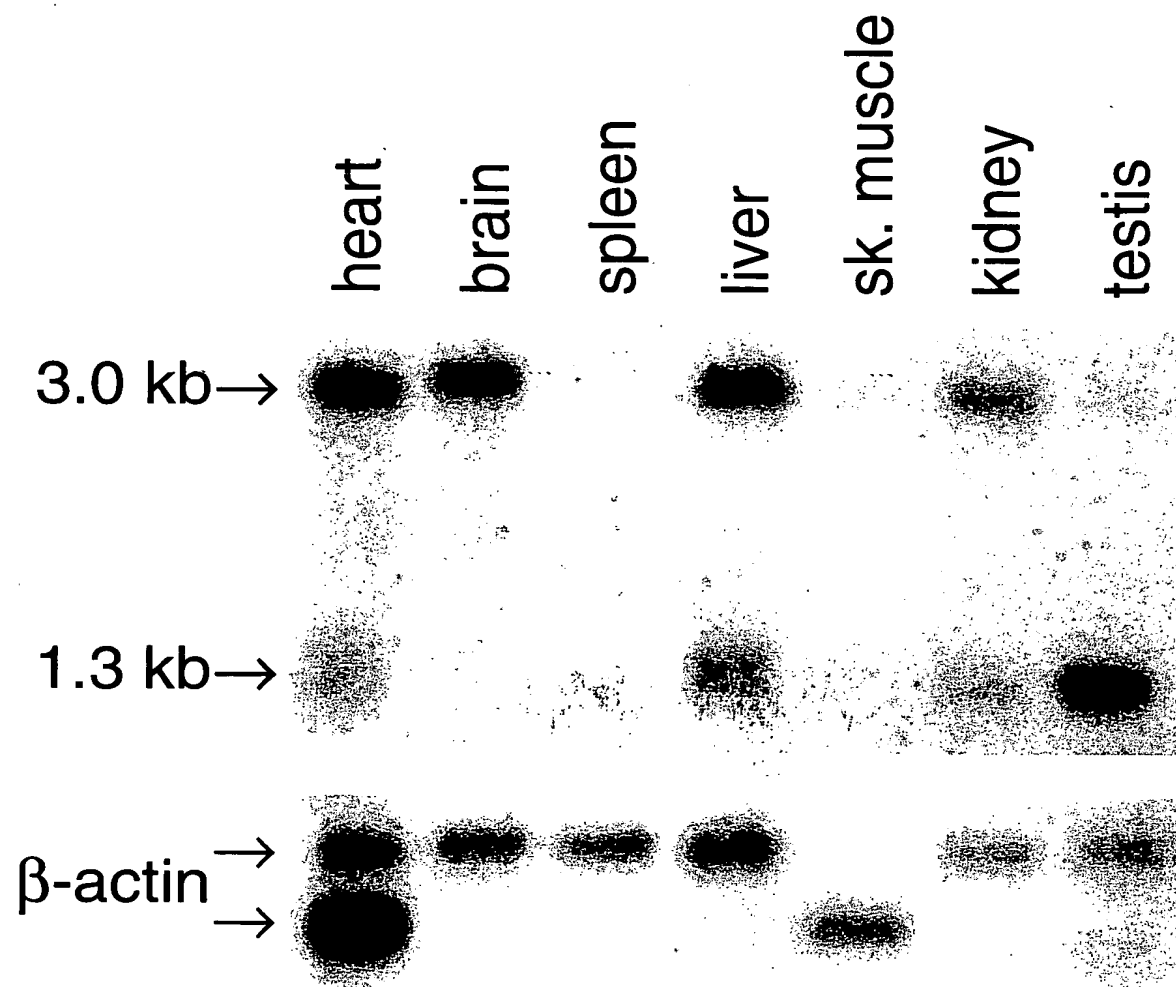
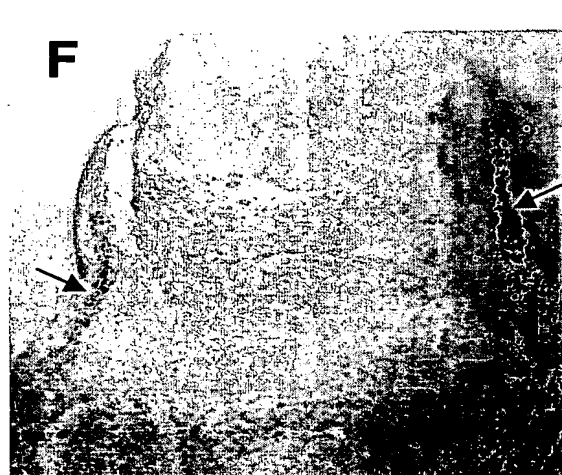
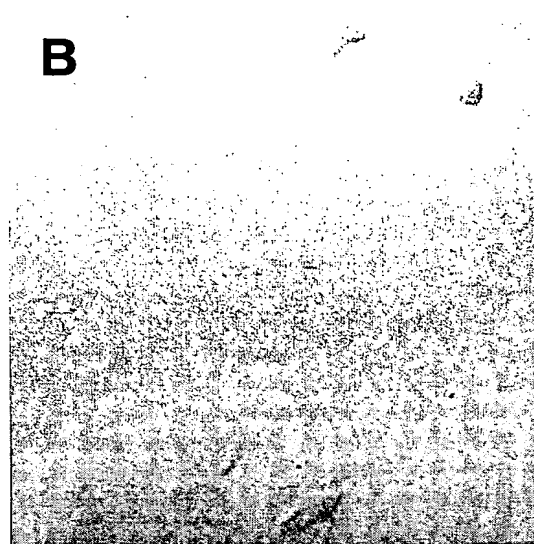
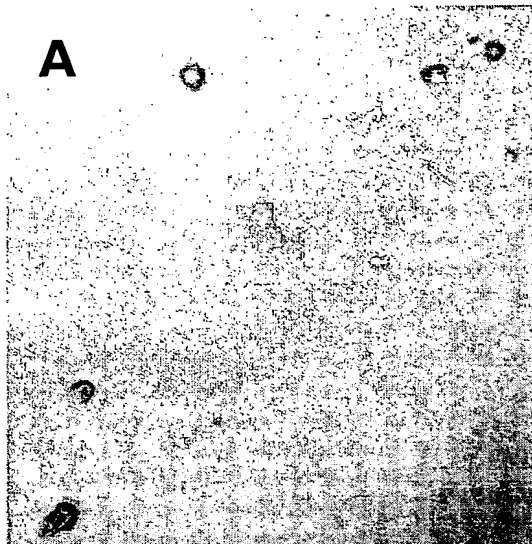
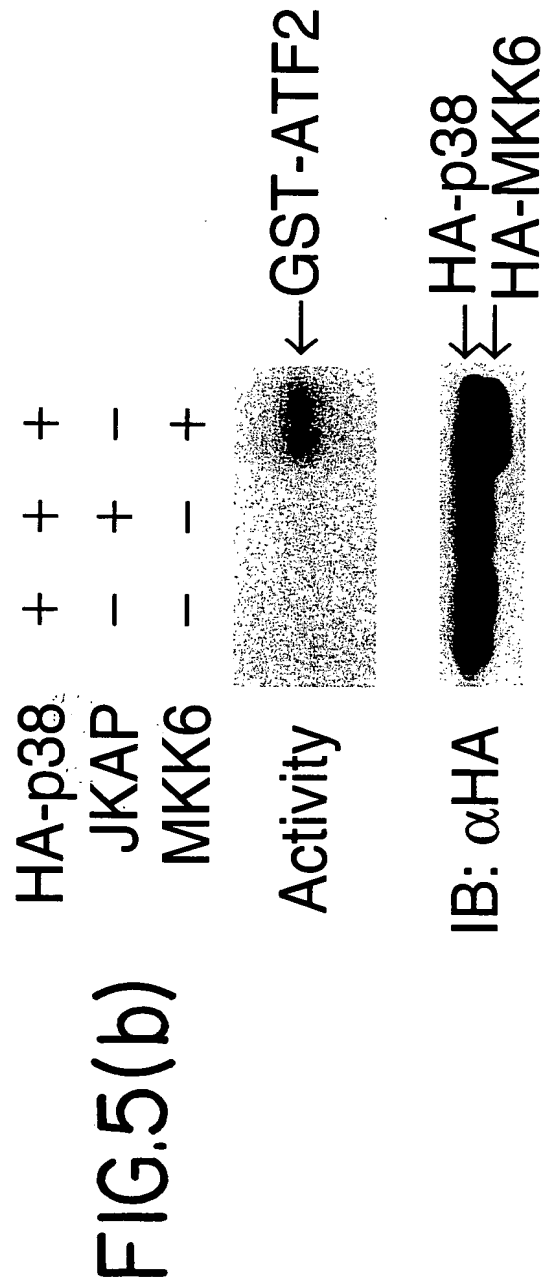
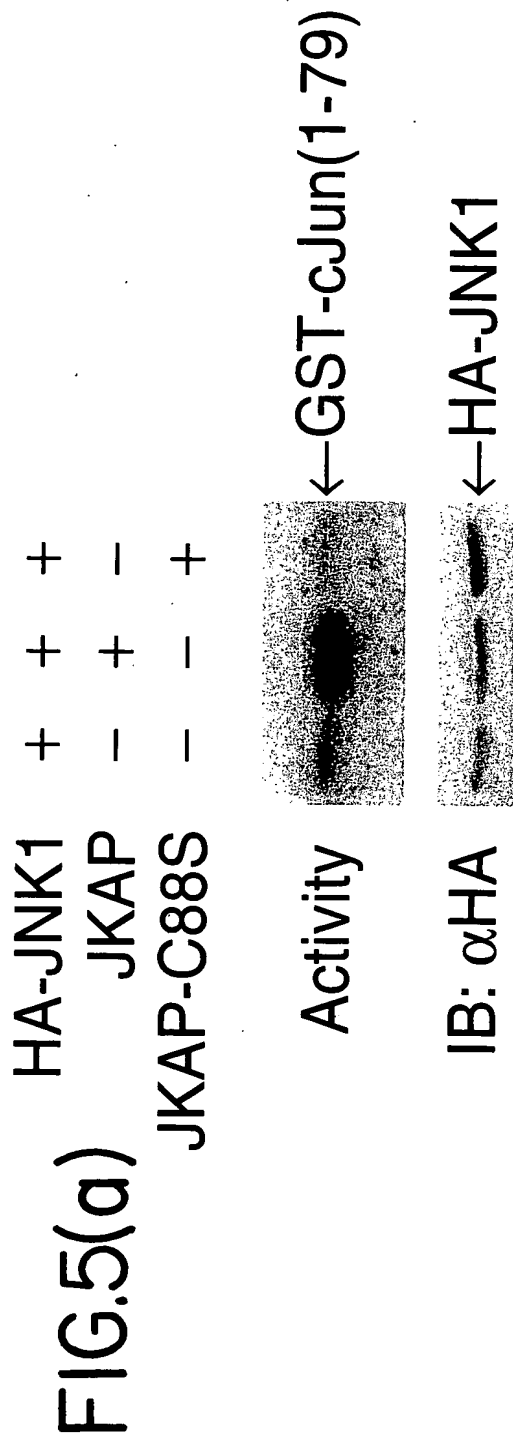


FIG.4

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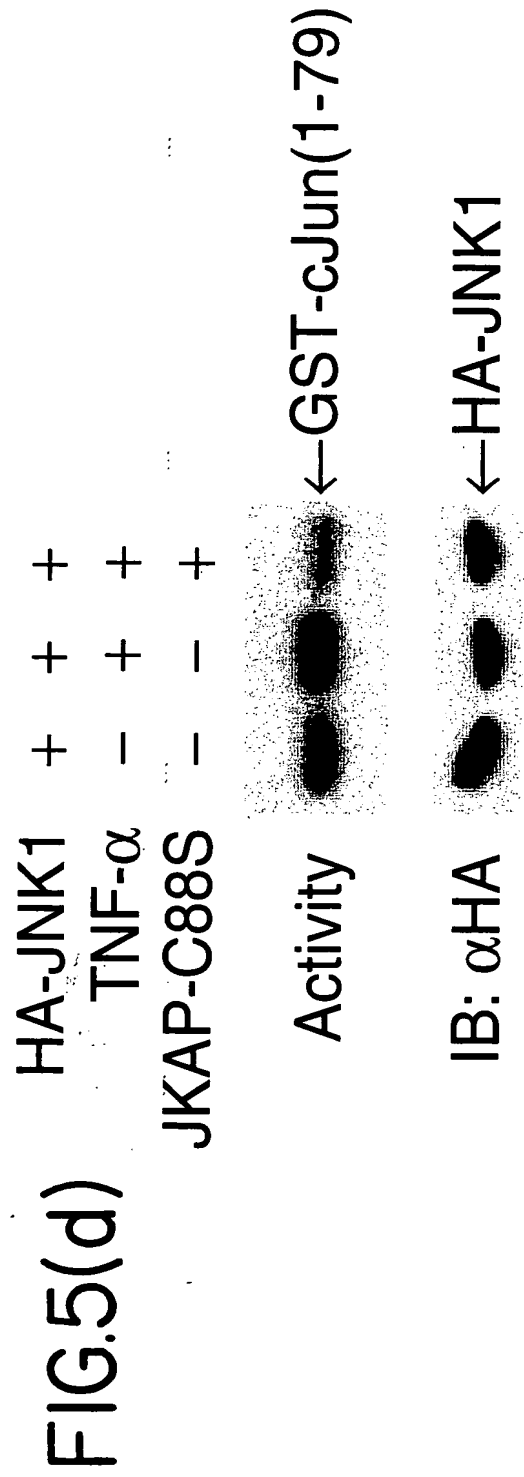
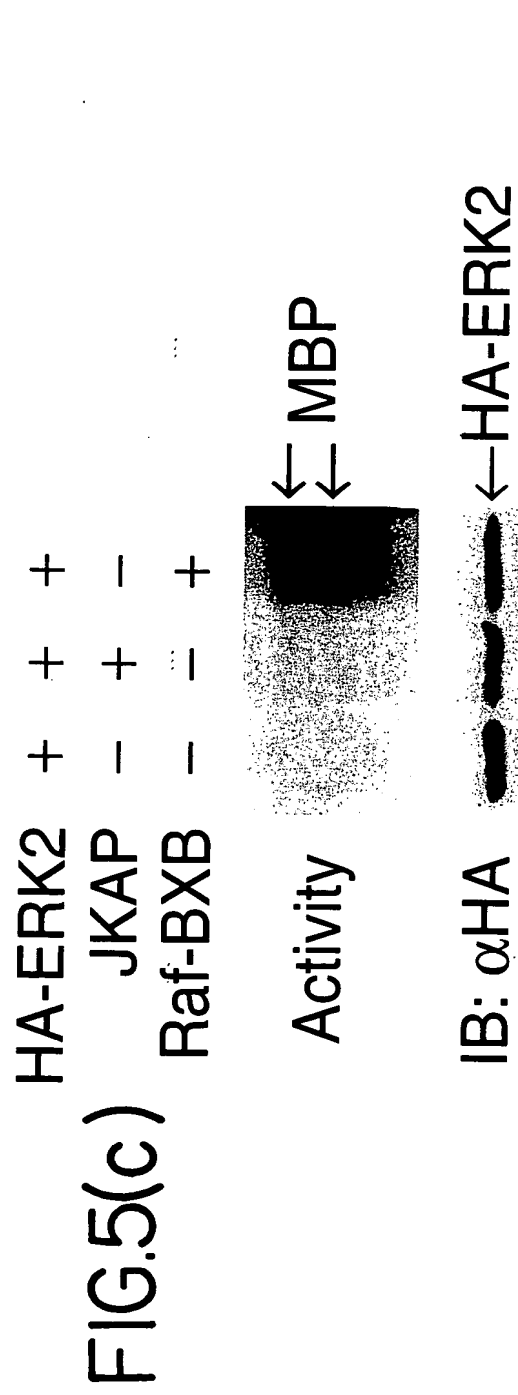
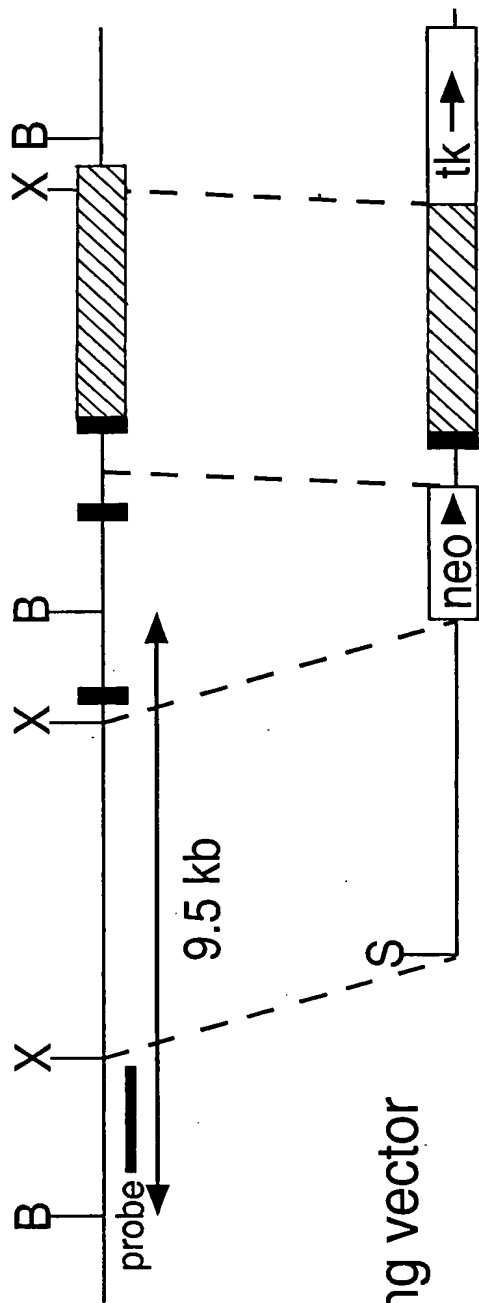


FIG.6(a)

Jkap locus

Targeting vector

Homologous
recombination

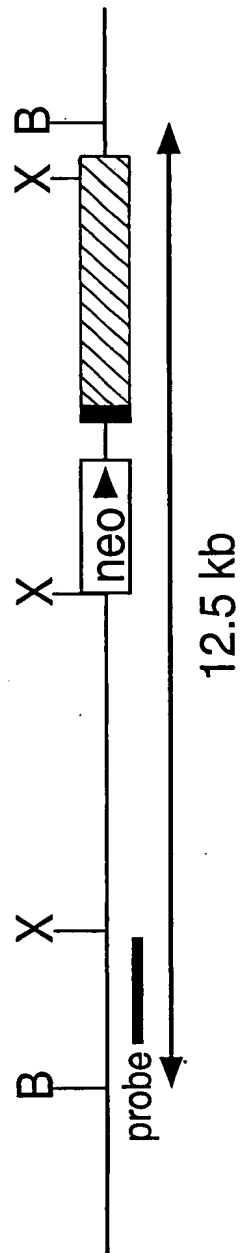
Mutated *Jkap* locus

FIG.6(b)

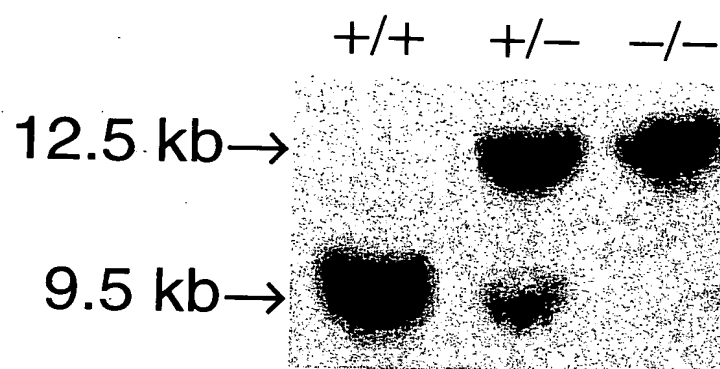


FIG.6(c)

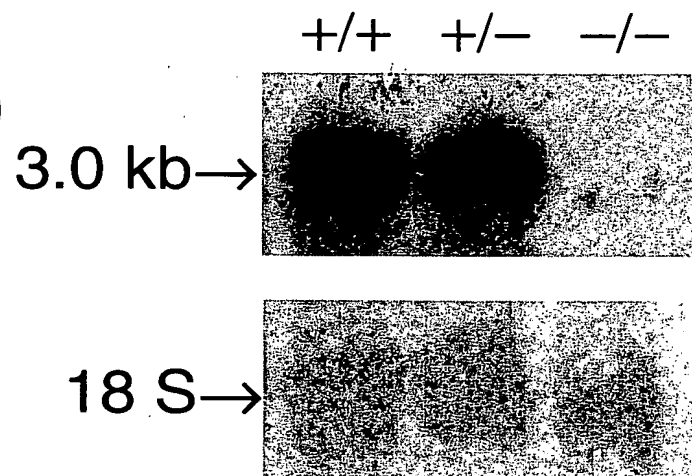


FIG.7(a)

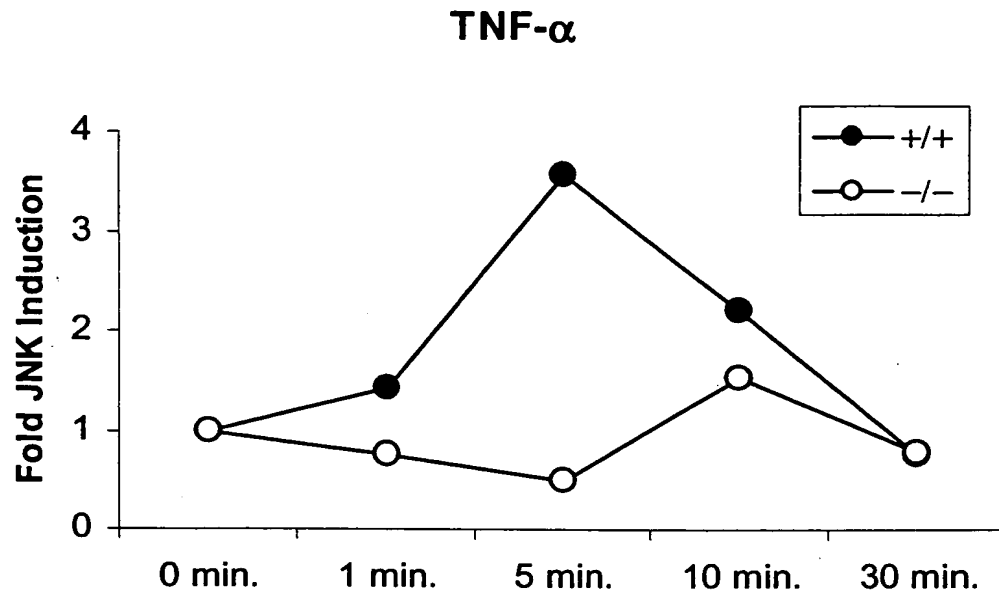


FIG.7(b)

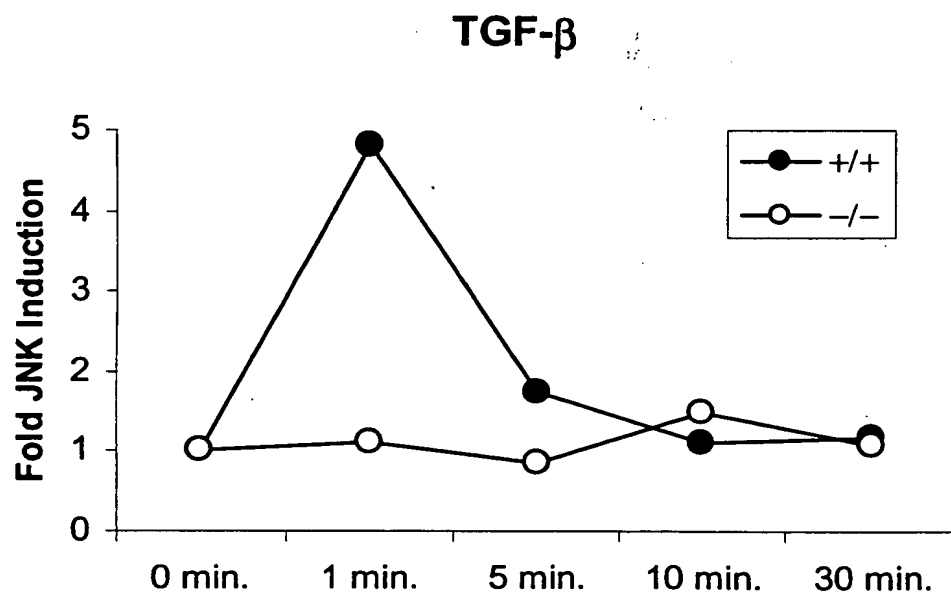


FIG.7(c)

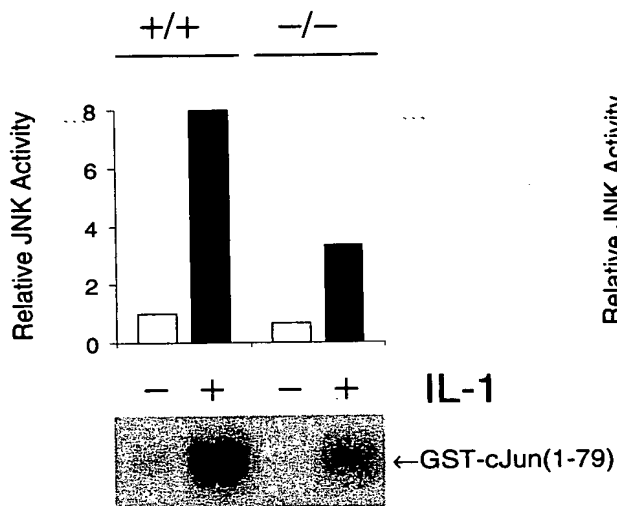


FIG.7(d)

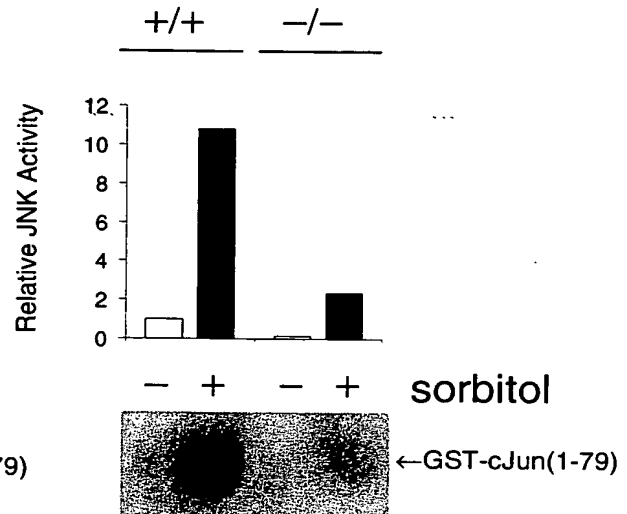


FIG.7(e)

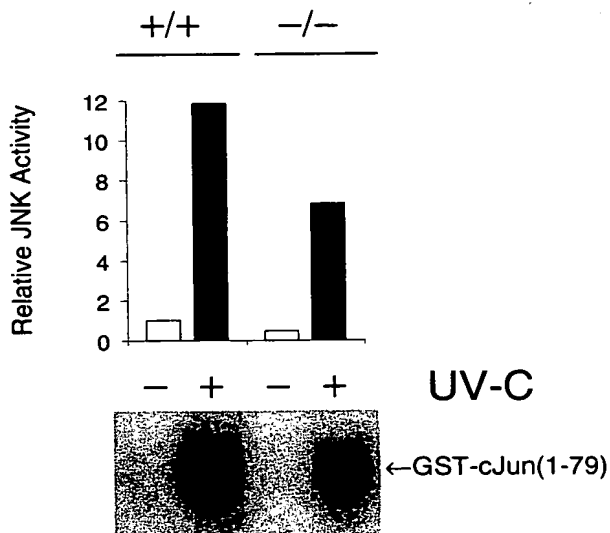


FIG.7(f)

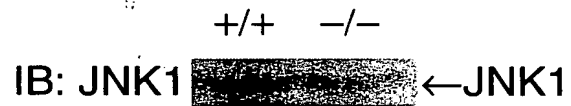


FIG.7(g)

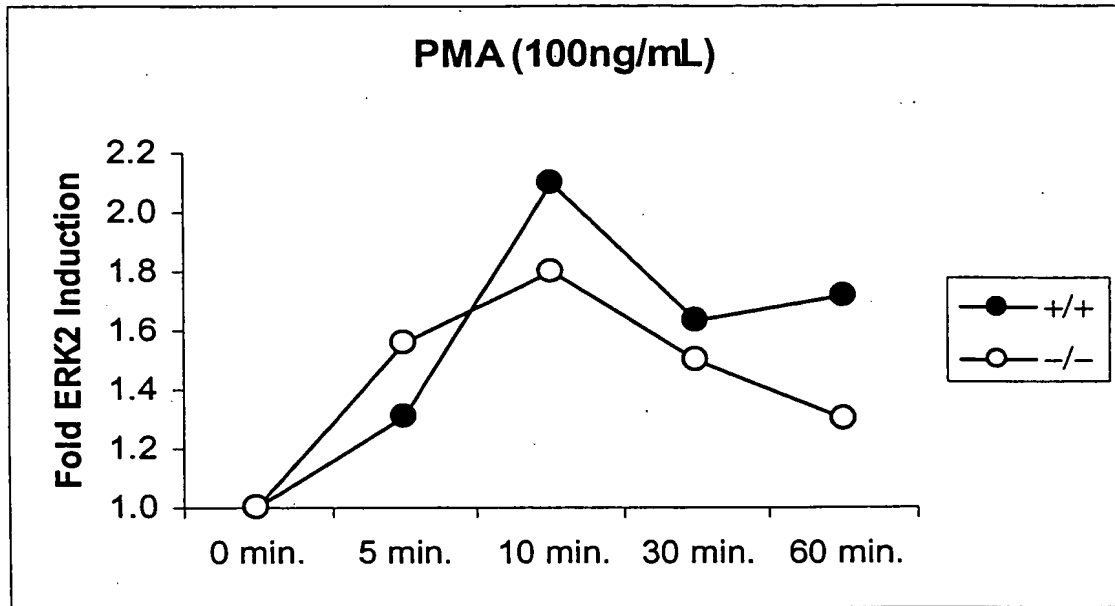
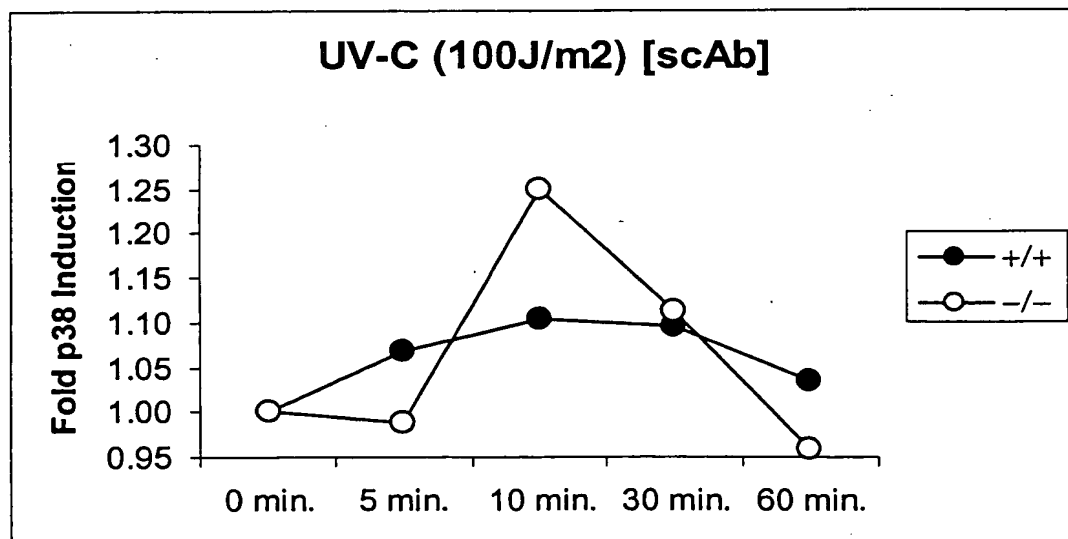


FIG.7(h)



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FIG.8(a)

HPK1	-	+	+
<i>myc</i> -JKAP	-	-	+

IP: α HPK1IB: α *myc*← *myc*-JKAPIB: α HPK1

← HPK1

FIG.8(b)

JKAP	-	-	+
HPK-1	-	+	+
HA-JNK1	+	+	+

Activity



← GST-cJun(1-79)

FIG. 8(c)

